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Filling the Landfills? : 2010-2025 Forecast of Solid Waste Generation in BC

This article is excerpted from the recently released report, *Solid Waste Generation in BC: 2010-2025 Forecast.*

The report is available on our website: www.bcstats.gov.bc.ca

Predicting future waste quantities is a vital component of waste management that aids in the managing and planning of waste programs. Waste projection results are valuable tools that can be used to inform policy decisions as well as development and enhancement of waste collection and treatment services.

British Columbia is comprised of 29 unique regional districts (RDs), each of which are responsible for managing waste residuals and tracking waste statistics and composition at landfills within their respective municipalities. The province and its regional districts rely on solid waste studies to provide information about the various waste streams and to assist with the development of waste reduction strategies.

As existing recycling, product stewardship and other programs become more common and new programs are developed, more waste will be diverted from landfills. Historical data confirm this likelihood. For example, between 2000 and 2010, as numerous programs were implemented and improved upon, the amount of material diverted for recycling increased dramatically in the province, nearly tripling (+193.3%) from 660 thousand tonnes to 1.9 million tonnes over the ten-year period.[1]

With this in mind, three projection scenarios, with varying degrees of measures taken to divert waste from disposal, have been developed to estimate future solid waste management components. The first scenario is one in which the current diversion rates (2010 base year) remain unchanged, but plans for new industry product stewardship programs proceed as expected, except enhanced construction, renovation and demolition (CR&D) waste programs do not materialise as quickly as expected. The second scenario predicts the potential change in disposal rates if recycling/diversion rates were to increase, particularly with respect to organics, and where CR&D programs are implemented. A final scenario is one whereby aggressive strides are made in order to push recycling/diversion levels to new heights.

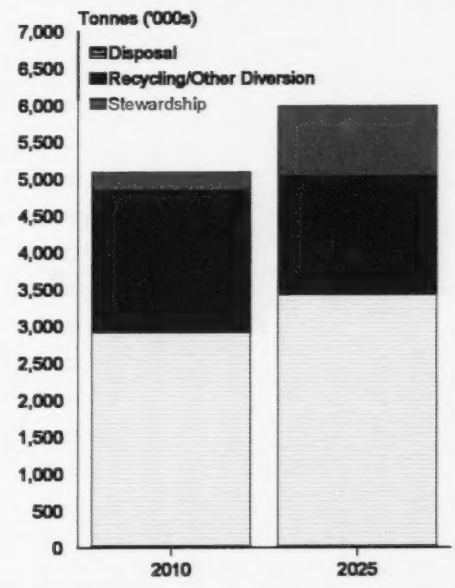
[1] For more detailed information on division of waste by sector, as well as how sectors are determined, see the BC Stats report: "British Columbia's Solid Waste Flow, 2006" (February, 2010) and the Natural Resource Canada report: "An Analysis of Resource Recovery Opportunities in Canada and the Projection of Greenhouse Gas Emission Implications" (March, 2006).

Scenario 1

The starting point for any projection of waste quantities must be the current status of solid waste management. For the purposes of these projections, estimates made using existing data for 2010 are considered to be representative of current (status quo) conditions.

In 2010, an estimated 2.9 million tonnes of solid waste were disposed of in BC's landfills. Meanwhile, approximately 1.9 million tonnes of material were diverted from landfills for recycling and a further 242 thousand tonnes were collected through stewardship programs. This amounts to a provincial diversion rate of 43%.

Combined Residential, ICI and CR&D sector Solid Waste Projections - Scenario 1

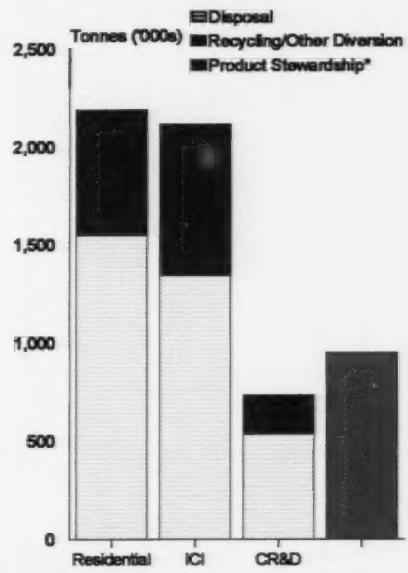


Source: BC Stats, 2012

It is predicted that overall waste generation will climb by 17.7% between 2010 and 2025. If current diversion rates are maintained, it is estimated that disposal tonnage in BC will reach 3.1 million tonnes (+7.7%) by 2015 and 3.4 million tonnes (+17.5%) by 2025. The amount of materials recycled is forecast to decline 16.4% to 1.6 million tonnes in 2025 due to a shift of a considerable portion of goods currently collected through recycling programs toward new stewardship programs. As a result, product stewardship is predicted to climb substantially (+292.3% to almost one million tonnes).

In terms of waste breakdown by key sectors, the first scenario forecast determines that disposal of residential waste (+21.2%) in the province's landfills would see the largest increase between 2010 and 2025, followed by the industrial, commercial and institutional (ICI) sector (+17.6%) and construction, renovation and demolition (CR&D) sector (+8.0%).

Projected Shares of Waste Generated, 2025 - Scenario 1



Source: BC Stats, 2012
*Product Stewardship is not available by sector

Scenario 2

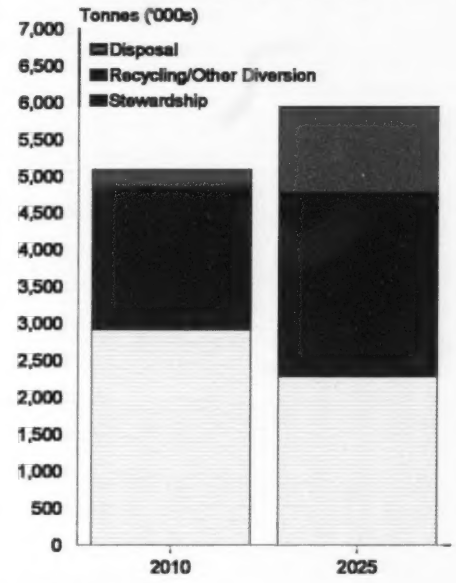
Given the trend toward increased recycling, stewardship and other practices, a scenario

whereby waste diversion efforts experience moderate expansion appears to be fairly realistic. For example, the province's regions vary significantly in the recycling options available. Consequently, per capita disposal and recycling rates differ widely across the province. By boosting the regions that are lacking in programs, such as curb-side recycling collection, to levels that some other regions have managed to reach, a substantial reduction in waste disposed at landfills could be attained.

Further, should more regions expand upon their existing programs, like "Blue Box" and "Blue Bag," by including other types of waste, such as organics for composting, the potential for further waste diversion becomes even greater. Encompassing approximately 40% of total residential waste and close to 30% of ICI waste disposed in the province, organic waste (food and other organic wastes) was the biggest player in BC's landfills in 2006.[2] It is estimated that, collectively, organics made up more than a quarter of British Columbia's overall waste stream in 2006. Organics are primarily compostable items such as food and yard waste and comprise a particularly hefty share of waste disposed of at landfills in the residential and ICI sectors.

While overall waste generation in BC will continue to rise (+17.7%), in this moderate growth scenario, diversion rates are predicted to jump from 43% to 62% between 2010 and 2025. Waste disposal is projected to decline from 2.9 million tonnes in 2010 to 2.3 million tonnes (-21.8%) in 2025, while it is estimated that recycling could jump from 1.9 million tonnes to 2.5 million tonnes (+29.2%) over the same period. Product stewardship could also play a large role in the increased diversion of waste, potentially climbing 376.5% from 242 thousand tonnes to 1.2 million tonnes.

Combined Residential, ICI and CR&D sector Solid Waste Projections - Scenario 2

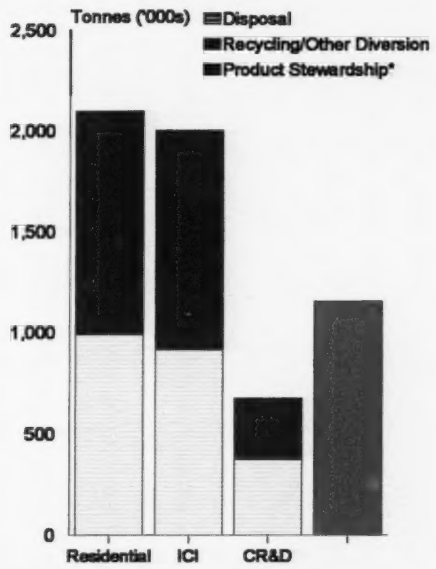


Source: BC Stats, 2012

For the different sectors, the scenario 2 forecast suggests that CR&D would experience the most notable decrease in disposal of waste (-24.4%), as the result of a substantial advance in recycling and stewardship programs. Disposal of residential waste at landfills could see a decline of about 22.4% by 2025, followed closely by the ICI sector (-20.0%). This would translate to a 43.7% boost in recycling of residential materials and a 9.8% increase for the ICI sector. In addition, a significant portion of the waste would be diverted to product stewardship programs.

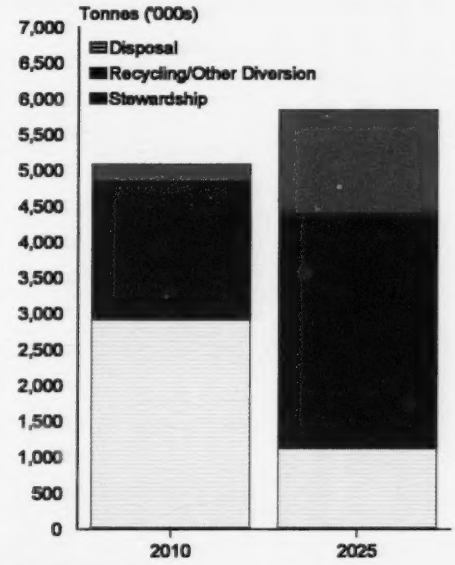
[2] BC Stats, "British Columbia's Solid Waste Flow, 2006" (February, 2010).

Projected shares of waste generated, 2025 - Scenario 2



Source: BC Stats, 2012
*Product Stewardship is not available by sector

Combined Residential, ICI and CR&D sector Solid Waste Projections - Scenario 3



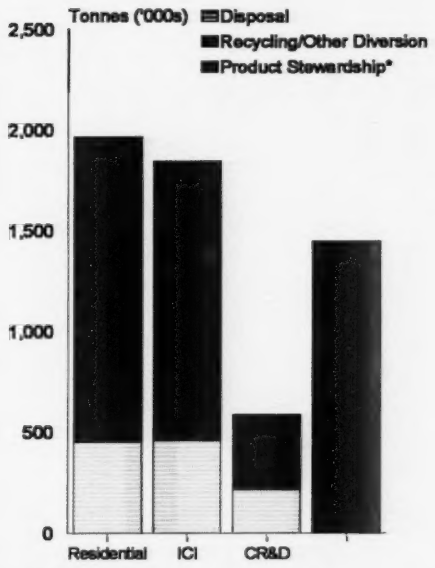
Source: BC Stats, 2012

Scenario 3

The third and final scenario examined in this projection involves one whereby hard-line strides are made in order to push diversion levels to new heights. Under this model, a predicted 69.5% leap (to 3.3 million tonnes) in recycling/other diversion and a 496.2% jump (to 1.4 million tonnes) in product stewardship would cause the volume of waste disposed of in landfills to shrink by nearly two thirds (-61.6%) to 1.1 million tonnes by the year 2025.

With a 96.9% surge in residential recycling/other diversion, the amount of household waste disposed of in landfills would shrink to just 448 thousand tonnes by 2025. Similarly, the ICI and CR&D sectors would experience substantial boosts in recycling (+39.8% and +119.0%, respectively), pushing the non-residential disposal tonnage down by well over a third. Table 3 offers annual data estimates for this scenario, with a breakdown by sector.

Projected shares of waste generated, 2025
- Scenario 3



Source: BC Stats, 2012
*Product Stewardship is not available by sector

What's Next?

The future of BC's waste disposal rates is heavily reliant on the number, type and adoption rate of waste diversion programs by the province and its municipalities. Altering the current trend and ensuring further waste prevention strategies could include measures such as further education, incentives, disincentives, and new and/or amended regulations. Future changes to existing waste management practices, such as the upcoming Capital Regional District's ban on landfill disposal of kitchen scraps, have the potential to dramatically impact the current waste management infrastructure in BC.[3]

Given the rising population in British Columbia, an increase in waste generated in the province is inevitable, regardless of the direction or intensity of diversion programs.[4] As such, the real prospective benefit to monitoring, developing, and implementing diversion programs lies in the moderation of waste that is disposed of in landfills. There is a substantial cost borne by municipalities to find and develop sites for new landfills when old ones reach the end of their lifespan. On the other hand, there is also a significant cost of administering an increasing number of product stewardship and other diversion programs. However, spending in this capacity will likely outweigh the cost of developing new landfills as well as offset much of the environmental impact of developing waste facilities at new sites and not recycling (i.e., wasted resources).

Costs to the environment are often overlooked because they are not necessarily measured in monetary terms and they tend to be external to the person or organization that is creating the waste. However, it is a price that, in the long run, all citizens will have to pay.

[3] For more on the 2015 Hartland Landfill phased-in ban on kitchen scraps, as well as links to other municipalities offering such programs, see http://www.crd.bc.ca/waste/organics/kitchen-scraps.htm

[4] For provincial and sub-provincial population projections, see www.bcstats.gov.bc.ca

Table 1 - Scenario One

('000s of Tonnes)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Disposal	2,912	2,944	2,996	3,042	3,092	3,135	3,180	3,218	3,244	3,264	3,289	3,312	3,338	3,367	3,395	3,422
Residential	1,275	1,289	1,305	1,322	1,340	1,359	1,378	1,397	1,416	1,435	1,454	1,473	1,491	1,510	1,528	1,545
ICI	1,142	1,159	1,180	1,199	1,221	1,238	1,257	1,272	1,282	1,289	1,298	1,305	1,313	1,323	1,333	1,343
CR&D	495	496	511	521	531	537	545	549	546	540	537	534	533	535	535	534
Recycling	1,935	1,955	1,991	2,024	1,776	1,513	1,533	1,546	1,554	1,556	1,563	1,571	1,580	1,593	1,606	1,618
Residential	771	779	794	807	707	602	610	616	618	619	622	625	629	634	639	644
ICI	993	1,003	1,022	1,038	886	726	736	742	745	746	749	752	756	762	767	773
CR&D	171	173	176	179	182	184	187	189	190	191	193	194	195	197	199	201
Product Stewardship	242	245	248	252	539	835	847	858	870	882	894	905	917	928	940	951
Total Generated	5,089	5,144	5,235	5,317	5,406	5,482	5,560	5,623	5,667	5,702	5,746	5,788	5,835	5,888	5,940	5,991
Diversion Rate	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%

Table 2 - Scenario Two

('000s of Tonnes)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Disposal	2,912	2,869	2,827	2,784	2,742	2,700	2,657	2,615	2,573	2,530	2,488	2,446	2,403	2,361	2,318	2,276
Residential	1,275	1,256	1,237	1,218	1,199	1,180	1,161	1,142	1,122	1,103	1,084	1,065	1,046	1,027	1,008	989
ICI	1,142	1,127	1,111	1,096	1,081	1,066	1,051	1,035	1,020	1,005	990	974	959	944	929	913
CR&D	495	486	478	470	462	454	446	438	430	422	414	406	398	390	382	374
Recycling	1,935	2,028	2,156	2,273	2,115	1,880	1,929	1,902	1,976	2,039	2,112	2,183	2,259	2,340	2,421	2,501
Residential	771	811	860	907	844	751	770	786	826	865	905	945	985	1,026	1,067	1,108
ICI	993	1,035	1,088	1,136	1,021	861	873	875	902	924	950	974	1,001	1,030	1,060	1,090
CR&D	171	182	209	229	250	268	286	241	247	250	257	264	273	283	293	302
Product Stewardship	242	246	253	260	549	903	974	1,047	1,060	1,074	1,088	1,101	1,115	1,129	1,142	1,155
Total Generated	5,089	5,144	5,235	5,317	5,406	5,482	5,560	5,623	5,667	5,702	5,746	5,788	5,835	5,888	5,940	5,991
Diversion Rate	43%	44%	46%	48%	49%	51%	52%	53%	55%	56%	57%	58%	59%	60%	61%	62%

Table 3 - Scenario Three

('000s of Tonnes)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Disposal	2,912	2,792	2,672	2,553	2,433	2,314	2,194	2,075	1,955	1,836	1,716	1,597	1,477	1,357	1,238	1,118
Residential	1,275	1,220	1,165	1,110	1,054	999	944	889	834	779	724	669	614	558	503	448
ICI	1,142	1,096	1,051	1,005	959	914	868	822	776	731	685	639	594	548	502	457
CR&D	495	476	457	438	420	401	382	363	345	326	307	288	270	251	232	214
Recycling	1,935	2,105	2,310	2,503	2,422	2,206	2,331	2,144	2,233	2,373	2,520	2,666	2,816	2,971	3,126	3,280
Residential	771	847	931	1,014	988	904	959	944	992	1,066	1,141	1,216	1,291	1,367	1,443	1,518
ICI	993	1,065	1,148	1,227	1,141	981	1,022	973	996	1,048	1,103	1,156	1,212	1,270	1,328	1,387
CR&D	171	193	230	261	293	321	350	227	244	259	276	294	313	334	355	374
Product Stewardship	242	246	253	261	551	962	1,035	1,257	1,332	1,347	1,364	1,380	1,396	1,413	1,429	1,445
Total Generated	5,089	5,144	5,235	5,317	5,406	5,482	5,560	5,623	5,667	5,702	5,746	5,788	5,835	5,888	5,940	5,991
Diversion Rate	43%	46%	49%	52%	55%	58%	61%	63%	66%	68%	70%	72%	75%	77%	79%	81%